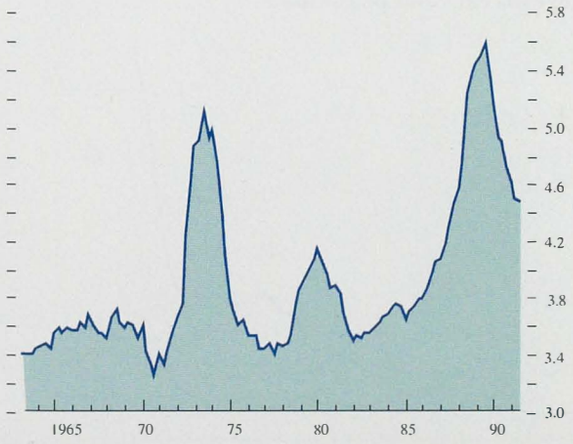
House prices, arrears and possessions

Following the house price boom of the late 1980s, the early 1990s witnessed a sharp rise in mortgage arrears and possessions and falls in nominal house prices. This article[1] examines these developments and the interactions between them. Simulations using a small econometric model suggest measures that reduce possessions could play an important role in stimulating recovery in the housing market.

House prices

Over the last 30 years, there have been three major house price booms—around 1973, 1980 and 1989—when the ratio of house prices to earnings increased sharply from its long-run, slightly rising, trend, before falling back (see Charts 1 and 2). The most recent of these booms was exceptional both in its strength and its duration. And, as Chart 2 shows, although real house prices fell further in the early 1970s than during the current downturn, this is the first time that average *nominal* house prices have fallen since the 1950s.

Chart 1
House price: earnings ratio

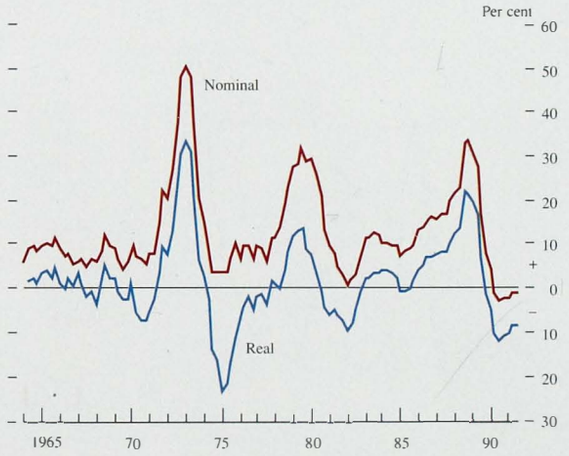


Department of Environment house price index and average annual earnings.

Three important factors have generally been cited to explain the recent behaviour of house prices: financial liberalisation, demography and expectations.

Financial liberalisation. During the first half of the 1980s, constraints on mortgage lending were significantly relaxed. Among other measures, the abolition of the 'corset'[2] in 1980 enabled banks to compete more effectively in the mortgage market; building societies were given increased freedom to set interest rates competitively; and in 1983, the decision to allow building societies to pay interest gross of tax gave them access to the wholesale money market. The effect of these changes on the average loan to value ratio on properties acquired by first-time buyers is illustrated in

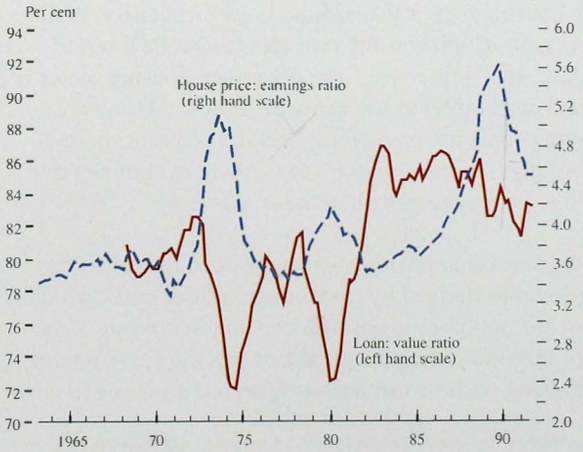
Chart 2
Real and nominal house price growth



Department of Environment house price index and RPI.

Chart 3. This chart reveals two interesting consequences of financial liberalisation. First, there was a marked increase in the average loan to value ratio in the early 1980s, as funds became more easily available. And second, and perhaps more importantly, unlike in previous house price booms, there was little mortgage rationing by building societies when house prices rose substantially in the late 1980s.

Chart 3
House price: earnings ratio and loan to value ratio for first-time buyers

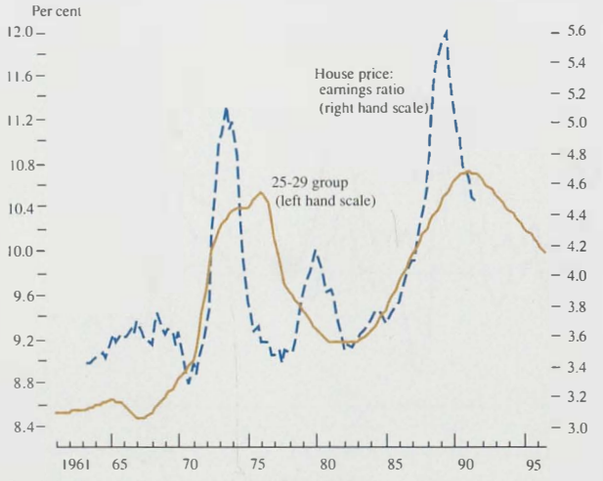


(1) Written by F J Breedon and M A S Joyce of the Bank's Economics Division.
(2) The supplementary special deposits scheme.

Throughout the boom, funds remained relatively easy to acquire and, during the downturn, loan to value ratios have, moreover, tended to fall rather than rise.

Demographics. The upsurge in house prices in the late 1980s may have been partly generated by the growth in the population age group most likely to enter the housing market. Chart 4 shows the proportion of the total population aged between 25 and 29 years old, a group that has been identified as particularly important for housing demand.(1) As the chart shows, increases in the size of this group have coincided with the two largest house price booms.

Chart 4
House price: earnings ratio and 25–29 year olds as a proportion of adult population



Population forecast: Government Actuary's Department.

Expectations. Confidence and expectations of rising house prices have clearly been of fundamental importance in determining the demand for housing. But analysing their role is less straightforward. One approach (2) follows from the fact that housing is an asset, whose rate of return is compared with those of other assets. The expected rate of return on a house has two components: the direct benefit it provides (shelter etc) and the expected increase/decrease in its value (its capital gain/loss). There is an analogy here with the dividend and expected capital gain on an ordinary share, though housing is clearly less liquid. Unfortunately, the direct benefit which housing provides cannot be inferred from data on private rents, since the rented housing sector is too small and subject to too many distortions. However, assuming people are prepared to spend a constant share of their earnings on being housed, the growth in earnings can be used to proxy the growth of these benefits.

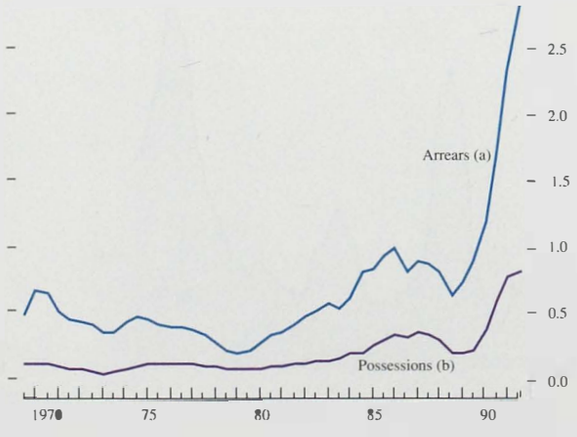
The asset market approach also implies that the price of housing can be derived by measuring its 'user cost', which is the post-tax opportunity cost of investing in housing. The price of housing is then the price that sets the cost (in terms of borrowing costs or lost returns from not investing in other assets) equal to the benefit of holding a house (its yield plus expected capital gain). However, since the asset market approach is related simply to an individual's demand for housing, aggregate factors such as the level of housing supply must also be taken into consideration as determinants of aggregate house prices.

By highlighting the role of expected capital gains, the asset market approach to house price behaviour helps to explain a number of features of the housing market. First, it is consistent with the observation that the high volatility of house prices (up to 50% increases in one year) is more reminiscent of financial asset prices than of goods prices. Second, it allows for the anticipated effect of future events, such as changes in taxation. In the house price equation described in the appendix, these expectational effects are modelled according to the rational expectations hypothesis, which assumes that people make the best use of all the available information in attempting to forecast future prices.

Arrears and possessions

As Chart 5 shows, the recent downturn in the housing market has been accompanied by an unprecedented rise in both mortgage arrears and possessions by lenders. In part, the rise in arrears reflects the general increase in default associated with the current economic downturn and high levels of indebtedness. But there are also specific factors associated with the housing market. A recent survey by the Council of Mortgage Lenders (CML) of the causes of arrears and possessions (3) identified five main factors that lead to arrears. These were: unemployment (20%–30%), a substantial drop in income (10%), business failure (5%), relationship breakdown (20%–25%) and financial mismanagement (15%).

Chart 5
Mortgage arrears and possessions



Half yearly data.
(a) Mortgages over 6 months in arrears as a percentage of the outstanding number of mortgages.
(b) Possessions as a percentage of the outstanding stock of mortgages, expressed at an annual rate.

(1) See A Milne (1990), 'Income, demography and UK house prices', *LBS Discussion Paper* 30–90.
(2) See J M Poterba (1984), 'Tax subsidies to owner-occupied housing: an asset market approach', *Quarterly Journal of Economics*, November, pages 729–52.
(3) Coles (1992), 'Causes and characteristics of arrears and possessions', *Housing Finance*.

These factors have all occurred in past recessions, however, and cannot on their own explain the exceptionally sharp rise of arrears and possessions in the current downturn. What has made the current downturn in the housing market unusual is the combination of falling *nominal* house prices and high loan to value ratios for most recent buyers. This has led to a greatly increased number of home-owners whose outstanding mortgage debt is greater than the value of their property (ie they have negative equity). This means that, whereas in the past the usual causes of arrears and possessions would have led homeowners either to sell their properties or to negotiate further loans to avoid possession, this course of action has increasingly not been available. Those experiencing repayment difficulties, therefore, have sometimes had little choice but to enter arrears, and eventually be possessed. The role of negative equity is noted in the CML survey and accords with its finding that the groups most likely to get into difficulty are those first-time buyers who purchased at the height of the 1988–89 boom and those who borrowed at high loan to value ratios.

Loan to value ratios for first-time buyers in 1989

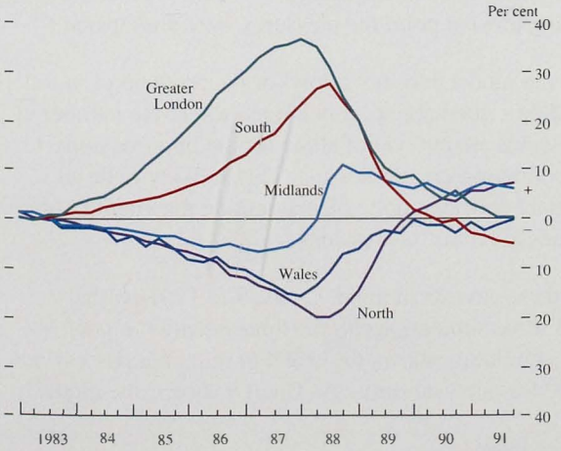
Per cent

Loan to value	Share of total
< 50	7.1
50–59	4.7
60–69	4.4
70–79	5.6
80–89	9.5
90–94	10.7
95–99	22.2
100 +	35.8

Source: Department of Environment. Based on a sample of building societies.

The table, which shows the distribution of loan to value ratios for first-time buyers in 1989, illustrates the extent to which mortgages of around 100% of the value of the property became available (about 58% of these mortgages were 95% or above in this sample). This clearly increased the likelihood of negative equity.

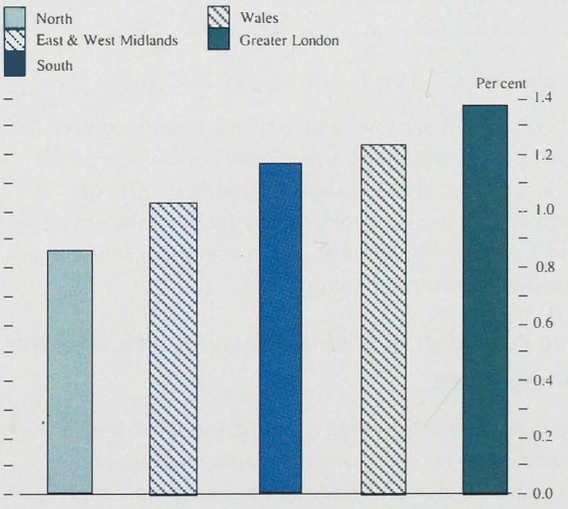
Chart 6
Percentage deviation of regional house prices from the national average since 1983



Source: Department of Environment.

The link between house prices and possessions can also been seen at a regional level. Chart 6 shows the pattern of regional house prices relative to the national average since 1983. Although house prices in London and the South grew far more rapidly than the national average in the late 1980s, the subsequent downturn saw prices in those regions fall particularly sharply, so that their average rate of increase since 1983 has been below the national average. Chart 7 suggests that there may be a link between these regional house price movements and possession orders. Regions that have experienced the greatest declines in house prices also appear to have the highest incidence of possession (with the exception of Wales).

Chart 7
Regional distribution of court orders for 1991 (a)



(a) Private mortgage possession orders granted as a percentage of mortgages.

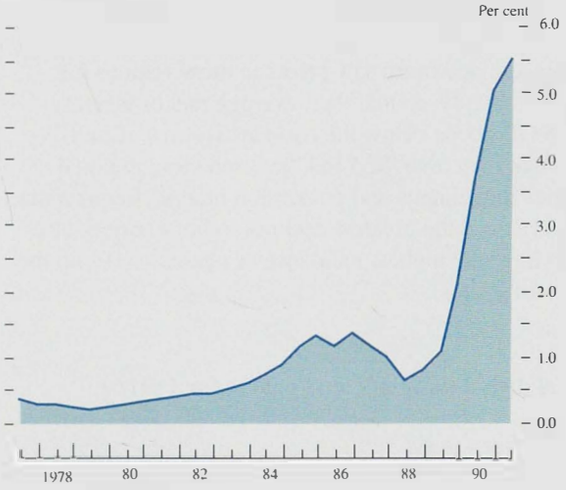
The regional distribution of the stock of mortgages has been proxied by the proportion of the stock of dwellings in each region (Table 2.24 *Housing and Construction Statistics*) which have mortgages (Family Expenditure Survey, Table 20).

Sources: Lord Chancellor's Dept., *Housing and Construction Statistics*, Family Expenditure Survey.

The prospect of decreasing equity has implications for lenders' possession policy, since falling house prices imply a greater cost for postponing possessions (in terms of capital losses) than would otherwise be the case. Lenders' decisions to possess are currently also being influenced by two offsetting factors. First, as well as the general cost of initiating a possession, the current scale of possessions is having a significant depressing effect on house prices. As Chart 8 shows, possessions now constitute over 5% of total housing turnover. Since possessions reduce housing demand relative to supply (those households whose properties are possessed do not readily re-enter the owner-occupied housing market, though their properties do) they can have a significant effect on house prices. This would appear to be one of the motivations behind recent efforts by lenders to initiate mortgage rescue schemes.

On the other hand, although lenders have significant incentives to initiate more lenient possession policies at present, the problem of moral hazard may limit their ability to do so. Moral hazard occurs when borrowers perceive that

Chart 8
Possessions as a percentage of housing turnover



Half-yearly data: assumes turnover in Scotland and Northern Ireland 10% of total.

the costs of default are low, which provides an incentive for them to default or to engage in reckless borrowing (given that lenders cannot always assess the credit quality of prospective borrowers). Lenders may feel that they need to maintain a credible threat of possession in order to maintain their borrowers' incentive to repay.(1)

A three equation model of house prices, arrears and possessions

The appendix presents a three equation model of house prices, arrears and possessions that captures most of the effects described above. The econometric results imply strong interactions between the three variables: arrears and possessions are strongly related to house price movements through the latter's impact on the value of housing equity, and house prices are affected by the influence of possessions on housing demand.

Apart from possessions, the equation suggests that house prices are determined in the long run by incomes, wealth, user cost (the calculation of this user cost term is described in Appendix 2), the general level of prices, demography, financial liberalisation, and housing supply. The first three terms capture the asset market approach discussed above. In the short run, effects from the components of wealth, and expectations of future capital gains (where expectations are modelled according to the rational expectations hypothesis), are also important.

In the model, arrears are determined by the borrowers' financial situation and are influenced by the unemployment rate, incomes, loan to income and debt service ratios as well as dynamic effects from the value of housing equity. Possessions are modelled as the lenders' decisions (even though about 45% of possessions are voluntary and are often constrained by the difficulty of obtaining a court order). The model suggests that they are determined mainly by the rate of arrears, the average length of arrears, the value of housing equity and interest rates.

Since the behaviour of house prices, arrears and possessions appears to have changed markedly in the late 1980s, and the equations are estimated on the assumption that their behaviour is still fundamentally the same, the three equations were tested by estimating them up to the end of 1985 only. The results showed that the equations were broadly stable and could have predicted the current conjuncture. The possessions equation was an exception, in that it seriously overpredicted possessions in 1991. This overprediction is consistent, however, with the observation that lenders have already become more lenient in their possession policy and are currently possessing fewer properties than a simple economic calculation would suggest.

Using this three equation model, it is possible to assess the likely impact of a reduction in possessions on house prices. Before doing this, however, a number of caveats to the results should be highlighted.

- In these simulations, housing supply is assumed to be fixed so that changes in house prices affect demand only. Although this is a reasonable assumption to make in the short run, in a model where expectations of future house price movements play such an important role, excluding the effects of changes in supply is likely to cause the simulations to overstate house price changes.

- The simulations exclude general macroeconomic effects outside the housing market, which is of particular importance for the interest rate simulation.

- As with any estimated model, concerns about the quality of data used cast doubt on the results. This is particularly true of the arrears and possessions data, which the CML (who collect the data) feel should be treated with some caution, particularly before 1982.

- Although expectations are formed rationally, the simulations presented below assume that the measures described are unanticipated. This produces a larger effect on house prices than if the measures were anticipated. (Simulations with anticipation present the problem of deciding at what point the measures were anticipated.)

- Since the model does not allow for the problem of moral hazard described above, simulations where the number of possessions are cut do not allow for the possible impact of encouraging greater arrears. This is likely to be an important consideration when assessing the viability of schemes to reduce possessions.

Bearing these caveats in mind, Charts 9 to 11 show the results of three simulations on the three equation model. The first simulation shows the effect of reducing possessions by 20,000 for one year only. As Chart 9 shows, the model

(1) Another factor which may be discouraging individual lenders from setting up a mortgage rescue scheme is that any resultant strengthening of aggregate house prices benefits all lenders. There may therefore be an incentive for some lenders to 'free ride' on the actions of others.

implies that such a measure would have a substantial impact on house prices in the short run, increasing them by about 5% above what would otherwise have occurred. This increase in house prices then causes another 6,000 possessions to be avoided by increasing the value of housing equity. However, since the reduction in possessions occurs for only one year, prices quickly fall back to base levels. The second simulation shows the impact of a permanent reduction in possessions of 4,000 a year. As with the first simulation, the short-run impact is quite substantial, causing house prices to rise by 1.7% in the first year and causing an additional reduction in possessions of about 2,000.(1) After the first year prices fall back but, because the reduction is recognised by the market as permanent, house prices stay about ½% above base over the rest of the simulation period. The third simulation shows the direct impact of a 1 percentage point cut in interest rates on house prices. This causes an increase in house prices, which averages about 2% over the simulation period, but does not have the large short-run effects seen in the first two simulations. On average over the simulation, a 1 percentage point cut in interest rates reduces possessions by about 1,500 a year.

Conclusions

The house price boom of the late 1980s may have been mainly initiated by income growth and demographic effects, and facilitated by the financial liberalisation which occurred earlier in the decade. Once the boom was under way, however, it is likely that it was reinforced by expectations of further rises in house prices, so that when the peak was passed the downward adjustment required in demand and prices was substantial. In the subsequent downturn the combination of record debt service ratios, rising unemployment, falling nominal house prices and high loan to value ratios led to an unprecedented rise in arrears and possessions. The combined effect of the last two factors increased the probability of borrowers having negative equity, which prevented many of those who were experiencing payment difficulties from relieving them by realising the equity in their property (by either trading down or getting an additional loan). There is, however, some tentative statistical evidence that suggests that lenders have already relaxed their possessions policy somewhat in response to the current situation.

The simulations presented in this article highlight the interactions between house prices and possessions. They also suggest that in the short run, prices respond more rapidly to reduced possessions than to interest rate changes. The simulations do not, however, capture all of the likely implications of various policies to stimulate the housing market. Two particularly important caveats need to be borne in mind: first, the model does not allow for the fact that cutting possessions may increase arrears for moral hazard reasons; and second, the simulations do not include the general macroeconomic effects of a cut in interest rates, nor do they allow for any second round effects on the supply of housing.

Chart 9
Simulation 1: effect on house prices of a 20,000 reduction in possessions for one year

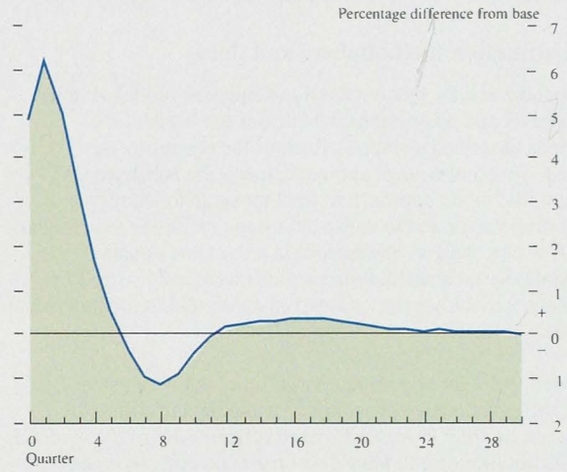


Chart 10
Simulation 2: effect on house prices of a 4,000 per annum reduction in possessions

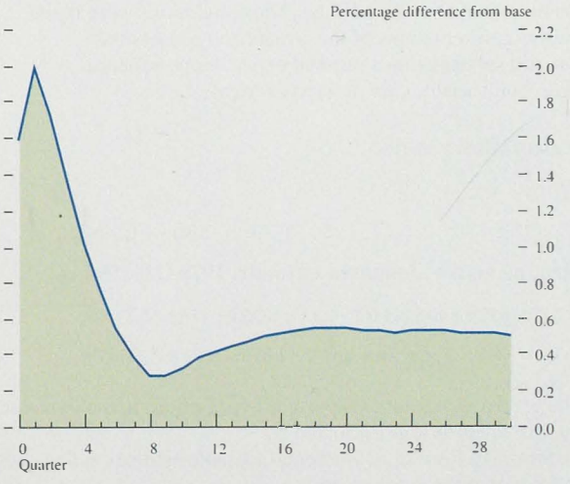
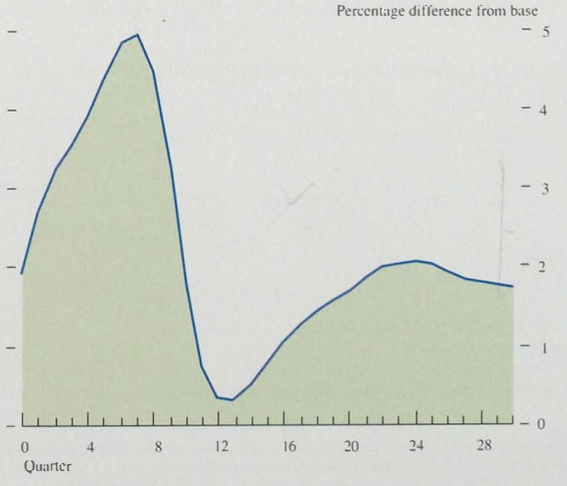


Chart 11
Simulation 3: effect on house prices of a 1 percentage point cut in interest rates



(1) The short-run effect per possession is greater in simulation 2 than in simulation 1 principally because a permanent reduction has a greater impact on expected future house prices.

Appendix 1

A model of house prices, arrears and possessions

(a) Estimation methodology and data

This appendix briefly sets out the three equation model of house prices, arrears and possessions, which was the basis of the simulations described above. [1] Each of the equations was estimated using a two-stage approach, using the Johansen [2] maximum likelihood approach in the first stage to identify a cointegrating vector and in the second stage including the residuals from this vector (lagged one period) in a dynamic equation. Instrumental variable estimation methods were used wherever endogenous variables were included as regressors in the individual equations.

The model could not be estimated as a simultaneous system because the equations were estimated using data of different frequencies, in order to make the most efficient use of the available data. The absence of quarterly data on arrears and possessions meant that the arrears and possessions equations were estimated using bi-annual data, with data prior to 1982 being interpolated from annual data. The house price equation, in contrast, was estimated using quarterly data, with quarterly data for possessions (used as one of the explanatory variables) interpolated from the available bi-annual and annual data. The simulations were based on quarterly representations of the arrears and possessions equations and solved using a rational expectations solution algorithm. The variables are defined overleaf.

(b) Estimation results

(i) House prices

Table 1 (a)
Cointegrating vector, Johansen estimate, 1970 Q1–1990 Q3

$\ln HP/P = 2.87 \ln RPDI + 0.15 \ln FW/P - 2.13 \ln KOHS + 17.84\ P2529$

Maximum lag in VAR = 2; other included I(0) variables: (USERC - $\Delta \ln HP_{t+1}$)

Given the presence of future (expected) house prices in the dynamic equation, the equation was estimated by Hayashi-Sims,[3] a form of instrumental variable estimation that also corrects for moving average errors.

Table 1 (b)
IV MA(1) estimate of the house price equation, 1970 Q2–1990 Q3

$\Delta \ln HP/P =$	-0.870 (9.2)	+0.87 (Δ 4 ln RPDI)/4 (4.0)	+0.52 Δ ln (NLA/P) (5.9)
	+0.27 Δ ln (NLA/P)$_{t-2}$ (3.0)	-0.20 Δ (REPO/KOHS)$_{t-1}$ (4.1)	
	-0.0051 (USERC–100 $\Delta \ln HP_{t+1}$) (8.8)		-0.070 Z_{t-1} (8.5)
	+0.16 LVR_{t-3} (4.1)	-0.01 Q1 (2.2)	+0.025 Q3 (5.4)

$U = E - 0.240\ E_{t-1}$ (1.9)

$R^2 = 0.82$; SE = 0.016; DW = 1.98;
Instrumented variables: $\Delta \ln HP_{t+1}$;
Additional instruments: Q2, ΔEER_{t-1} and $\Delta \ln PPOX_{t-1}$.
The absolute value of asymptotic t-ratios are given in parentheses.

Where:
$Zt-1$ = the lagged residuals from the cointegrating regression reported in Table 1(a).
EER = effective exchange rate
PPOX = producer prices

(ii) Arrears

Table 2 (a)
Cointegrating vector, Johansen estimate, 1970 H2–1991 H1

$\ln ARR/M = 0.27 \ln UR - 0.61 \ln RPDI + 3.29 \ln AYR - 11.09 \ln UNEW + 0.49 \ln DSR$

Maximum lag in VAR = 2

Table 2 (b)
OLS Estimate of the arrears equation, 1971 H1–1991 H1

$\Delta \ln ARR/M =$	-3.54 (6.4)	+0.69 Δ(ln ARR/M)$_{t-1}$ (5.5)	+0.28 $\Delta \ln DSR_{t-1}$ (1.8)
	+0.40 $\Delta \ln DSR_{t-2}$ (2.5)	+0.82 $\Delta \ln UR$ (4.8)	+0.33 $\Delta \ln UR_{t-2}$ (2.5)
	-13.69 $\Delta \ln UNEW$ (5.8)	-0.99 $Z1_{t-1}$ (6.4)	

$R^2 = 0.82$; SE = 0.076; DW = 2.3; LM(1) = 2.3; LM(2) = 4.7;
RESET(1) = 1.3; NORMALITY (2) = 1.5; HETEROSCED (1) = 1.6
Where $Z1_{t-1}$ = the lagged residuals from the cointegrating regression reported in Table 2(a).
The absolute value of t-ratios are given in parentheses.

(iii) Possessions

Table 3 (a)
Cointegrating vector, Johansen estimate, 1970 H2–1991 H1

Unrestricted

$\ln REPO/M = 1.08 \ln ARR/M + 0.38\ R_m - 5.12 \ln UNEW$

Restricted

$\ln REPO/M = 1.00 \ln ARR/M + 0.40\ R_m - 7.41 \ln UNEW$;
LR test of the unit restriction on ln ARR/M: $\chi^2(1) = 0.033$

Maximum lag in VAR = 2

The resulting dynamic equation for possessions (shown in Table 3(b)) was estimated by instrumental variables because of the inclusion of a contemporaneous term in house price inflation. The equation performs reasonably well, except over the 1973 period which had to be dummied out; partly in consequence the equation exhibited some heteroscedasticity which was adjusted for using White's [4] method to obtain consistent standard errors.

Table 3 (b)
IV estimate of the possessions equation, 1970 H2–1990 H2

$\Delta \ln REPO/M =$	-0.56 (1.9)	+0.24 Δ(ln REPO/M)$_{t-1}$ (1.9)	-2.14 $\Delta \ln HP$ (2.3)
	-4.03 $\Delta \ln LVR$ (4.3)	+0.29 $\Delta \ln ARR12/M$ (4.5)	-0.09 $Z2_{t-1}$ (3.0)
	-0.28 D73H1 (4.2)		

$R^2 = 0.91$; SE = 0.079; DW = 1.7; LM(1) = 0.5; LM(2) = 0.6;
RESET(1) = 0.4; NORMALITY (2) = 0.1; MISSPEC(1) = 0.9;
Instrumented variable: $\Delta \ln HP$;
Additional instruments: $\Delta \ln RPDI$ and $\Delta \ln RPDI_{t-1}$.
The absolute value of asymptotic t-ratios are given in parentheses.

Where:
$Z2_{t-1}$ = the lagged residuals from the cointegrating regression reported in Table 3(a).
D73H1 = dummy variable defined as 1 in 1973 H1, -1 in 1973 H2 and 0 elsewhere.

(1) Further details of the model and the theoretical background can be found in 'House prices, arrears and possessions:a three equation model for the United Kingdom' by F J Breedon and M A S Joyce, and 'The determination of UK house prices', by M A S Joyce and N O Kennedy, both Bank of England mimeos.
(2) See S Johansen (1988), 'Statistical analysis of cointegrating vectors', *Journal of Economics and Dynamics*, Vol.12, No. 2/3, pages 231–54.
(3) See F Hayashi and C A Sims (1983), 'Nearly efficient estimation of time series models with predetermined, but not exogenous instruments', *Econometrica*, Vol. 51, pages.783–98.
(4) See H White (1980), 'A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity', *Econometrica*, Vol. 48, pages 817–38.

Appendix 2

User cost

The nominal user cost measure (excluding expected capital gains) used in the empirical work reported in Appendix 1 above was defined as follows:

$$USERC = (1-\psi)\, R_m\, \alpha + (1-t_i)\, R_b\, (1-\alpha) + \kappa + \tau + \delta$$

ψ	=	Rate of mortgage interest tax relief for the standard rate tax-payer
R_m	=	Mortgage rate
α	=	Proportion of housing expenditure financed by mortgages
t_i	=	Income tax rate
R_b	=	Rate of return on invested funds
κ	=	Property taxes (rates only)
τ	=	Transactions costs
δ	=	Depreciation rate

Most terms in this equation are self explanatory though a few need further definition.

(1) ψ was calculated by weighting the standard rate of income tax by the proportion of mortgages that exceed the tax limit. For example, for the period 1982 to 1988, it is defined as:

$$\psi = t_i\, (1-(\beta.PG30+PG60))$$

β = proportion of single income mortgages (average was 25%)
PG30 = proportion of mortgages over £30,000
PG60 = proportion of mortgages over £60,000

(2) τ was defined as the sum of transactions costs, including estate agents fees (0.75%), legal costs (1%) and stamp duty. This was then divided by 32 to spread the cost over the average holding period of a house and scaled up to allow for discounting.

Additional data were supplied by the Department of Environment.

Data definitions

ARR	=	Mortgage arrears over six months
ARR6	=	Mortgage arrears six to twelve months
ARR12	=	Mortgage arrears over a year
AYR	=	Loan to income ratio for first time buyers (%)
DSR	=	Debt service ratio
FW	=	Gross financial wealth (£ millions)
HP	=	Mix-adjusted house prices, all dwellings UK (1985=1) (DE measure)
KHPT	=	Stock of mortgage lending (£ millions)
KOHS	=	Stock of owner-occupied dwellings (000's)
LVR	=	Loan to value ratio for first time buyers
M	=	Total number of outstanding mortgages (000's)
NLA	=	Net liquid assets (£ millions)
P	=	Consumers' expenditure price deflator (1985 = 1)
P2529	=	Proportion of adult population (18 and over) aged 25–29
REPO	=	Possessions
Rm	=	Building societies mortgage interest rate (%)
RPDI	=	Real personal disposable income (000's)
UR	=	Unemployment rate (%)
UNEW	=	Unwithdrawn equity, defined as: ((M/1000)HP - KHPT)/((M/1000)HP)
USERC	=	User cost of housing—see Appendix 2 (%)